Space Weather Forecast

Issued on Wednesday, 03 May 2023 at 01:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1 Minor-R2 Moderate radio blackouts throughout. Very slight chance of R3 Strong radio blackouts. Slight chance of G1/Minor Storm conditions to start and end the period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours. There are currently nine numbered sunspot regions on the visible disc. The largest remains for now the large complex region in the southwest. Its position approaching the limb makes any changes increasingly hard to discern. A large region in northeast quadrant has shown some simplification in the intermediate region of the group, but remains complex. A newly numbered large region rotating over the eastern limb, north of the ecliptic appears moderate complex and active, however confidence in the analysis is very low given the regions position on the eastern limb and may change significantly in the coming days. There is another large but magnetically simpler region also rotating over the eastern limb. All other sunspots are simple and/or small regions at present.

There are a number of potentially eruptive filaments (arc of plasma) on the Earth-facing disc, however no new Earth-directed Coronal Mass Ejections (CMEs) were observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar winds have eased slowly from a peak around 510-530km/s early in the period, to slightly elevated levels more recently of around 480km/s. The Interplanetary Magnetic Field was weak, with the important north-south component also varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to Low activity is expected with isolated Moderate-flares likely and a slight chance of becoming High from any isolated Strong-flares.

Solar Wind / Geomagnetic Activity: There are several CMEs which are expected to largely miss Earth in the coming days, however some glancing influences cannot be ruled out. The most likely candidate CME to affect Earth left the Sun on the 29 Apr and is expected to pass by early Day 1 (3 May). Current slightly elevated wind conditions are expected to gradually ease towards background levels through the start of the period before faster winds associated with a coronal hole in the southern hemisphere near centre-disc is anticipated to begin to affect Earth perhaps from late on Day 3 (5 May) but more likely into Day 4 (6 May). Geomagnetic activity is expected to be Quiet to Unsettled, but with a chance of Active intervals from any CME influence, most likely into Day 1 (3 May) and a slight chance of G1 Minor Storm intervals. Any influence from faster winds also brings the chance of isolated Active intervals on Day 4 (6 May).

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be background with no solar radiation storms occurring. However count rates may increase with any notable flares that occur, with a slight chance of reaching the S1 Minor Radiation Storm threshold throughout.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	55	55	55	55
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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